unnecessary to retain *Fraseria*, and I propose that the two species at present assigned to it should be included in *Melaenornis*, which would now contain 13 species.

On present knowledge *M. annamarulae* would appear to have no particularly close relatives within the genus. It is tempting to link it with *M. ardesiaca* of the Congo/Uganda borders, which approaches it most closely in colour. That species, however, has a yellow (not brown) eye and differs in structural characters; more important, it is a forest edge form which occupies a lower stratum (Chapin 1953, A. Prigogine *pers. comm.*). Also, being a montane (not lowland) form remote from *M. annamarulae* a close relationship is unlikely on zoogeographic grounds. Indeed, as has been shown, *M. annamarulae* seems to be a connecting link between species hitherto considered to belong to different genera.

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Observations on the nestlings of the Goliath Heron, *Ardea goliath*, in Rhodesia

by J. Cooper and B. E. Marshall

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The behaviour of several species of herons of the genus *Ardea* is fairly well documented in the literature. Meyerriecks (1960) discusses that of the Great Blue Heron, *A. herodias*, and Lowe (1954) and others consider the Common or Grey Heron, *A. cinerea*. North (1963) discusses the breeding behaviour of the Black-headed Heron, *A. melanocephala*. However, relatively little is available on the behaviour of young of this genus while still on the nest.

The Goliath Heron, *A. goliath*, is as its name suggests one of the largest species in the genus. In Rhodesia it is a breeding resident throughout much of the country where suitable conditions exist though is not as common as the other species (*A. cinerea*, *A. melanocephala* and *A. purpurea*) that occur.

The Goliath Heron breeds regularly on Lake McIlwaine, an artificial lake near Salisbury, Rhodesia, where several nests were observed during 1969. The following observations come from two that contained nestlings.

When newly hatched the young are covered in greyish-white down and the iris is light green; the tarsi, feet and general skin colour being a pale lime-green and the bill a pale green-brown. At this stage the difference in size between siblings is obvious (possibly due to incubation starting with the

first egg laid and the subsequent staggered hatching). This size difference is shown by the following measurements taken on recently hatched downy young on 29th March, 1969:

Nestling 1	Culmen	19.5 mm.
	Tarsus	18.0 mm.
	Wing	16.5 mm.
Nestling 2	Culmen	24.5 mm.
	Tarsus	31.0 mm.
	Wing	28.0 mm.

At this stage the nestlings did not show fear to human intrusion, but only lifted their heads and emitted a continual hissing noise, probably a begging response.

At a different nest older young were observed. The history of it is shown as:

9th January, 1969	C/3
28th February, 1969	three well fledged young.
29th March, 1969	three young, one able to leave nest.
6th April, 1969	two young, both able to leave nest.

Assuming that laying was completed on the first visit (an unlikely event) and accepting the incubation period of 24–30 days given in McLachlan & Liversidge (1957), then the nestling period for two young was a minimum of 58 days, a substantially longer period than the "less than six weeks" mentioned in McLachlan & Liversidge (1957). Obviously further information is needed on this point.

The reaction of well-feathered young to human intrusion was very different to that of the younger ones previously described. On the 28th February, 1969 on our approach the birds were unable to stand, and all displays were given from a squatting position with partially raised breast. When faced with an intrusion the birds lifted up their heads, and raised the feathers of the

Plate 1. Forward Display: *A. goliath* nestlings.

crest and neck. The neck remained bent and the head was directed towards the intruder. In this position the wings were half spread and their upper surfaces turned towards the threat so that the apparent size of the bird was greatly increased. The bill was slightly open (Plate 1). This is the Forward Display of Meyerriecks (1960). The bulging eyes he described for *A. herodias* were noted in *A. goliath* and the now yellow irises and binocular vision lend an impressive effect to the display (Plate 2). In this position the bird with its puffed throat resembles *A. cinerea* in plate 4a of Lowe (1954).

Following the Forward Display the Full Forward Display of Meyerriecks (1960) was given. This consisted of sudden forward lunges that ended in an audible snap of the bill as the neck straightened and the breast lifted momentarily off the nest. The Full Forward Display was aimed at the intruder and represents a more aggressive state than that of the Forward Display. The nestling on the left of Plate 3 is straightening its neck in the Full Forward Display while the one on the right remains in the less aggressive Forward Display position.

The Full Forward Display usually terminates in a call in the adult *A. herodias* (Meyerriecks, 1960). However, Baerends & Van Der Cingel (1962) have shown that in the nestling *A. cinerea* a "snap display" is commoner than a "threat call", and they use the term "forward with snap" to describe this behaviour. *A. herodias* does occasionally give "ok" or "ark" calls with Forward and Full Forward Displays when in the nestling stage (Meyerriecks, 1962) as does *A. cinerea* (Baerends & Van Der Cingel, 1962) but the bill snap is more common. No calls were heard from the *A. goliath* nestlings during these displays.

In the nestling the two forward displays were usually directed upwards (see Plates) and not downwards as is usual in the adult. This is presumably because the display is directional and the intruder is usually above the level of the squatting young. What must be Full Forward Display is mentioned as occurring in the young of *A. goliath* by Benson & Serventy (1956) who also describe the plumage of the well-developed nestlings. Forward Display is described as occurring in the adult *A. melanocephala* by North (1963).

Not all the nestlings displayed in this manner. Although no size difference was observed one bird did not give forward displays and its head can just be seen in Plate 1, restricting itself to crest-raising only. Occasionally one of the birds scrambled to the far side of the nest and remained hunched up with sleeked feathers (the bird on the right in Plate 2). This is the Withdrawn Crouch of Meyerriecks (1960) and it appears to contain an important fear component not present in the two very different aggressive forward displays.

On two visits gular fluttering was observed. Meyerriecks (pers. comm.) considers this to be a heat-control mechanism and not necessarily part of any display. Although it continued during Forward Display it was also observed in the downy young on a hot cloudless day where previously a parent had been shielding them from the sun with half-open wings.

On later visits the nestlings could stand and leave the nest for the surrounding rock. At this stage the aggressive displays were not as easily elicited. This slackening off with increased mobility is mentioned by Baerends & Van Der Cingel (1962) for *A. cinerea*. Once young are able to leave the nest they can avoid intruders more successfully and this probably explains the reduction in display behaviour observed. One bird regurgitated during this avoidance procedure and another fell off the nest-rock into the lake and remained swimming nearby until rescued and replaced, in a water-logged condition.

Plate 2. Forward Display and Withdrawn Crouch: *A goliath* nestlings.

Plate 3. Full Forward and Forward Display: *A. goliath* nestlings.

Two aggressive displays and one fear display are described for the nestling of the Goliath Heron, *Ardea goliath*. They are similar to displays of the Common or Grey Heron, *A. cinerea*, and the Great Blue Heron, *A. herodias*.

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Some non-passerine bird weights from East Africa

by P. L. Britton

(Part II)

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Britton (1969) analysed 190 weights of this species from north-western Zambia where it is a breeding visitor from September to March. Both of the above weights are from its non-breeding range (Mackworth-Praed & Grant, 1952), and they are especially interesting as their dates are critical. The September bird was presumably about to migrate, and it is heavier than the maximum weight (88.0g) in Britton (*op. cit.*). In fact most males from Zambia weighed less than 70g and the only birds weighing over 82.5g were in March, prior to migration. The April bird is especially light (39g), the lightest bird in Britton (*op. cit.*) being 59.0g. It was possibly collected in an exhausted condition at the end of a lengthy migration, but there is nothing to suggest this on the collector's label.

Apus melba: ♀ 102; ♀ b. very fat, 103.
A. aequatorialis: ♂♂ 99, 100; ♀♀ 85, 93.3.
A. niansae: ♂ 31, Limuru, March.
A. barbatus: ♂ 41.5, Aberdares, March.
A. caffer: ♂♂ 20.5, 22, 22.1, 24; ♀ 22; ♀ b. 21; juv. ♀ 15, wing 113; ♀ 21.0.
A. affinis: ♂♂ 24, 25; 7 ♀♀, 18.5–27 (23.3); ♀♀ b. 25, 25, 25, 27; ♂ imm. 27; juv. 23, wing 105; pullus ♂ 17.5, wing 67.
Cypsiurus parvus: ♂♂ 10.0, 12.0; 6 ♀♀ 10.5–13.0 (11.8); ♂ imm. 11.5.
Chaetura sabini: 16.0, Kakamega Forest, July.
C. ussheri: ♀ 30.6, W. Usambara, July.
Colius striatus: 7 ♂♂, 47–54 (51.9); 6 ♀♀, 48–55 (52.3); ♀ 41; ♀ 52.
C. macrourus: ♂ 52.5; ♀♀ 40, 50; ♀ b. 51; ♂ imm. 36.
Apaloderma narina: ♀ 60.6; ♀ b. 65.5.
A. vittatum: ♂♂ 50, 56.7.
Ceryle maxima: ♀ 255, Usambara, Feb.
C. rudis: ♂ 81.5; ♀ 73.
Alcedo semitorquata: ♂ 40.2; ♀ 35.0; Amani, *c.* 1000 m, July.

Benson (1964) recorded the very similar *A. semitorquata* and *A. quadribrachys guentheri* at the same locality in north-western Zambia, and showed that, in or near the area of overlap in their ranges, *semitorquata* has a longer wing-length than *quadribrachys*, but there is no appreciable difference in bill-length.

I can find no published weights of *semitorquata*, but Britton & Dowsett (1969) and Verheyen (1953) together give seven weights of *A. q. guentheri* from Zambia and the Congo, and Forbes-Watson (in prep.) gives the following weights of *A. q. quadribrachys* from